

***Plusiodonta casta* (Butler, 1878) (Lepidoptera, Erebiidae, Calpinae) found in West Sayan (Central Siberia, Russia)**

Oleg E. Kosterin¹, Svyatoslav A. Knyazev²

1 Institute of Cytology & Genetics, Siberian Branch of Russian Academy of Science, 10 Academician Lavrentyev Ave., Novosibirsk, 630090, Russia

2 Altai State University, 61 Lenina St., Barnaul, 656049, Russia

Corresponding author: Svyatoslav A. Knyazev (konungomsk@yandex.ru)

Academic editor: R. Yakovlev | Received 28 November 2024 | Accepted 12 December 2024 | Published 18 December 2024

<http://zoobank.org/66FB33EC-EB38-4AF1-8895-A983139CF8C5>

Citation: Kosterin OE, Knyazev SA (2024) *Plusiodonta casta* (Butler, 1878) (Lepidoptera, Erebiidae, Calpinae) found in West Sayan (Central Siberia, Russia). Acta Biologica Sibirica 10: 1727–1732. <https://doi.org/10.5281/zenodo.14470324>

Abstract

The first record of *Plusiodonta casta* (Butler, 1878) from West Sayan Mountains in Siberia based on photographic observation is presented. The new finding is located ca 3,000 km to the west from the previously known distribution area of the species. The possible origin of the species population in Siberia is discussed.

Keywords

Lepidoptera, Erebiidae, Calpinae, *Plusiodonta casta*, Borus Mountain Range, West Sayan, Central Siberia, Shushenskiy Bor National Park, new record for Siberia

Introduction

On July 17–31, 2024 the first author undertook a survey of the fauna of butterflies (Lepidoptera, Papilionoidea) of the Mountain Forestry of the Shushenskiy Bor National Park, Shushenskoe District, Krasnoyarskiy Kray of Russia. This forestry occupies the Borus Mt. Range, one of the ranges of the mountain system of West Sayan,

including its foothills facing the Yenisei River. Because of the national park regime, collecting was limited to voucher specimens of those few butterfly groups in which species identification is impossible without examination of genitalia. No attention was paid on moths and no special attempt was made to attract them to light. Few moths were, however, attracted to the dim light from the windows of the Mountain Forestry office facing a steep, bushy and rocky SW slope of the right side of the Talovka River gorge near its mouth (510 m from the Yenisey River right bank), but were not collected. In the morning of 28.VII.2024 the first author paid attention to few small moths arrived at the preceding night, which were not noticed before and after, and wrote down this fact in his diary. These moths were photographed (Fig. 1) and later identified by photos by the second author.

Materials and methods

Photos were made by a Sony Cyber-shot DSC-RX10 camera. The map was compiled in Adobe Photoshop CS6 program using free relief map layout from <https://www.bluegreenatlas.com> licensed by <https://creativecommons.org/licenses/by/4.0/>.

Results

Plusiodonta casta (Butler, 1878)

Fig. 1

Photographic record. 2 individuals (Fig. 1), Russia, Krasnoyarskiy Kray, Shushenskoe District, the Borus Mt. Range NW foot, the Talovka River lowermost valley, the office of the Mountain Forestry of the Shushenskiy Bor National Park, 52.8354°N, 91.4169°E, 370 m a.s.l. See also: <https://inaturalist.org/observations/249348164>.

Discussion

It is commonplace that precise identification of moths is impossible without examination of the genitalic structures. However, we find it safe to ascribe this observation to *P. casta* for the following reasons. First, the wing pattern of these moths is identical to *P. casta*. Second, although the closest previous findings of this species were as far apart as three thousand kilometres in Amur Oblast', Khabarovskiy Kray and Primorskiy Kray in the Far East of Russia, also in Korea, Japan, China and Taiwan (Matov et al. 2019; Kononenko 2010) (Fig. 2), other species of the genus can be ruled out from biogeographical reasons for sure. The only alternative to *P. casta* worth considering could be an undescribed South Siberian species with identical appearance.



Figure 1. Two individuals of *Plusiodonta casta* (Butler, 1878) attracted by room light on the night 27/28.VII.2024 in the Talovka River lowermost valley, the Borus Range NW foothills, the office of the Mountain Forestry of the Shushenskiy Bor National Park. Shushenskoe District of Krasnoyarskiy Kray, photo by O.E. Kosterin.

However, we find this option very improbable. The larval foodplants of *Plusiodonta* are members of the families of Lardizabalaceae (*Akebia quinata*) and Menispermataceae (*Nephroia orbiculata* (L.) L. Lian & Wei Wang (= *Cocculus trilobus* (Thunb.) DC and *Menispermum dauricum*) (Sviridov 2003; Knonenko 2010; Matov and Kononenko 2012). The windows through which the moths penetrated into the house in the Talovka valley faced the steep rocky slope base (Fig. 3) with shrubby full of herbaceous liana of the Daurian Moonseed, *Menispermum dauricum* DC (Fig. 4) (see <https://inaturalist.org/observations/183034162>; <https://inaturalist.org/observations/183034163>), which is very sporadic in this area. We have to conclude that it was this plant on which the larvae of this moth develop in this locality. *M. dauricum* is widespread in the Far East but occurs also in South Siberia, extending from Transbaikalia to the west up to the Yenisey Valley (numerous records) plus an isolate at the Lebed' River in the northern Altai Mts (Peshkova 1994). Such a distribution suggests that the Daurian Moonseed is a Manchurian, or Palaearctaeartic nemoral floristic element which managed to penetrate to South Siberia. The moth,

which was considered a member of the Manchurian fauna, obviously followed moonseed in its spread to the west. Based on the analysis by Dubatolov and Kosterin (2000), we assume that the spread of such Manchurian faunal and floral elements to West Siberia took place as recently as in the Holocene, while previous hypotheses of existence of pre-glacial, Tertiary relics in the southern West Siberia did not hold water. According to Dubatolov and Kosterin (2000), such eastern nemoral species of Lepidoptera and plants appeared in Siberia in the Atlantic time of the Holocene, that is ca five thousand years ago. This time is far insufficient for formation of a neoendemic moth species in Siberia. So *P. casta* remains the only realistic option for the *Plusiodonta* moth now discovered in Central Siberia. Naturally this finding is to be confirmed in future by collecting voucher specimens in that place.

It is intriguing that *P. casta* escaped from being recorded in Siberia until present. This fact could be explained through the first author's observation that these moth arrived on one night only. If the imaginal stage of this species is indeed that short, it can be found only on a very improbable coincidence of a place (a moonseed habitat, which are very local) and date (of emergence of imagines) of collecting moths by light, plus the general scanty of lepidopterologists in Central and East Siberia should be taken into account as well.



Figure 2. Distribution map of *Plusiodonta casta* (Butler, 1878). New record in Siberia – red circle, previously known distribution area – blue fill with blue circles.



Figures 3–4. 3. Habitat of *P. casta* in the Talovka River lowermost valley, the Borus Range NW foothills, the office of the Mountain Forestry of the Shushenskiy Bor National Park. Shushenskoe District of Krasnoyarskiy Kray, 18.07.2024, photo by V.O. Kosterin. 4. *Menispermum dauricum* DC at in the shrubbery next to the Mountain Forestry office where *P. casta* was found, 4.VII.2023, O.E. Kosterin.

Acknowledgement

O. Kosterin is grateful to Elena Shikalova, the Scientific Vice Director of the Shushenskiy Bor National Park, for arrangement of the research and to Natalya Priydak and Valentin Kosterin for their help in the field. His work was partly supported by Scientific Program FWNr-2022-0019. The work of S.A. Knyazev was not funded.

References

- Dubatolov VV, Kosterin OE (2000) Nemoral species of Lepidoptera (Insecta) in Siberia: a novel view on their history and the timing of their disjunctions. *Entomologica Fennica* 11: 141–166. <https://doi.org/10.33338/ef.84061>
- Kononenko VS (2010) Micronoctuidae, Noctuidae: Rivulinae–Agaristinae (Lepidoptera). *Noctuidae Sibiricae* 2. Entomological Press, Soro, 475 pp.

- Peshkova GA (1994) Semeystvo – Menispermataceae - Lunosemyannikovye. In: Malyshev LI, Peshkova GA (Eds) Flora sibiriae in 14 tomis. Tomus 7. Berberidaceae-Grossulariaceae. Nauka, Novosibirsk, 10–11. [In Russian]
- Matov AYu, Kononenko VS (2012) Troficheskiye svyazi gusenitz sovkoobraznykh cheshuyekrylykh fauny Rossii (Lepidoptera, Noctuoidea: Nolidae, Erebidae, Eutelidae, Noctuidae). Dalnauka, Vladivostok, 346 pp. [In Russian]
- Matov AYu, Kononenko VS, Sviridov AV (2019) Erebidae. In: Sinev SY (Ed.) Catalogue of the Lepidoptera of Russia. Second Edition. Zoological Institute RAS, St.Petersburg, 16. [In Russian]
- Sviridov AV (2003) Podsemeystvo Catocalinae [Subfam. Catocalinae]. In: Ler AP (Ed.) Key to the insects of Russian Far East. Vol. V. Trichoptera and Lepidoptera. Pt 4. Dal'nauka, Vladivostok, 86–187. [In Russian]